US009319410B1

(12) **United States Patent**
Patel et al.

(10) **Patent No.: US 9,319,410 B1**
(45) **Date of Patent: Apr. 19, 2016**

(54) **ELECTRONIC SHARED-DOCUMENT REPOSITORY**

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(73) Assignee: **FUNDOLOGY, INC.**, Streamwood, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 75 days.

(21) Appl. No.: **14/149,162**

(22) Filed: **Jan. 7, 2014**

(51) **Int. Cl.**
H04L 29/06 (2006.01)

(52) **U.S. Cl.**
CPC ***H04L 63/10*** (2013.01); ***H04L 63/08*** (2013.01); ***H04L 63/083*** (2013.01)

(58) **Field of Classification Search**
CPC H04L 63/10; H04L 63/083; H04L 63/08
See application file for complete search history.

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2013/0040657	A1 *	2/2013	Jackson	G06F 21/84 455/456.1

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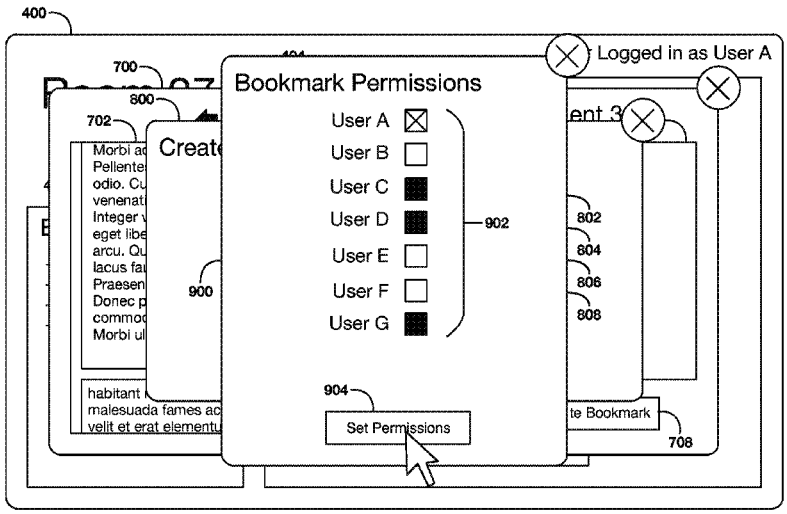
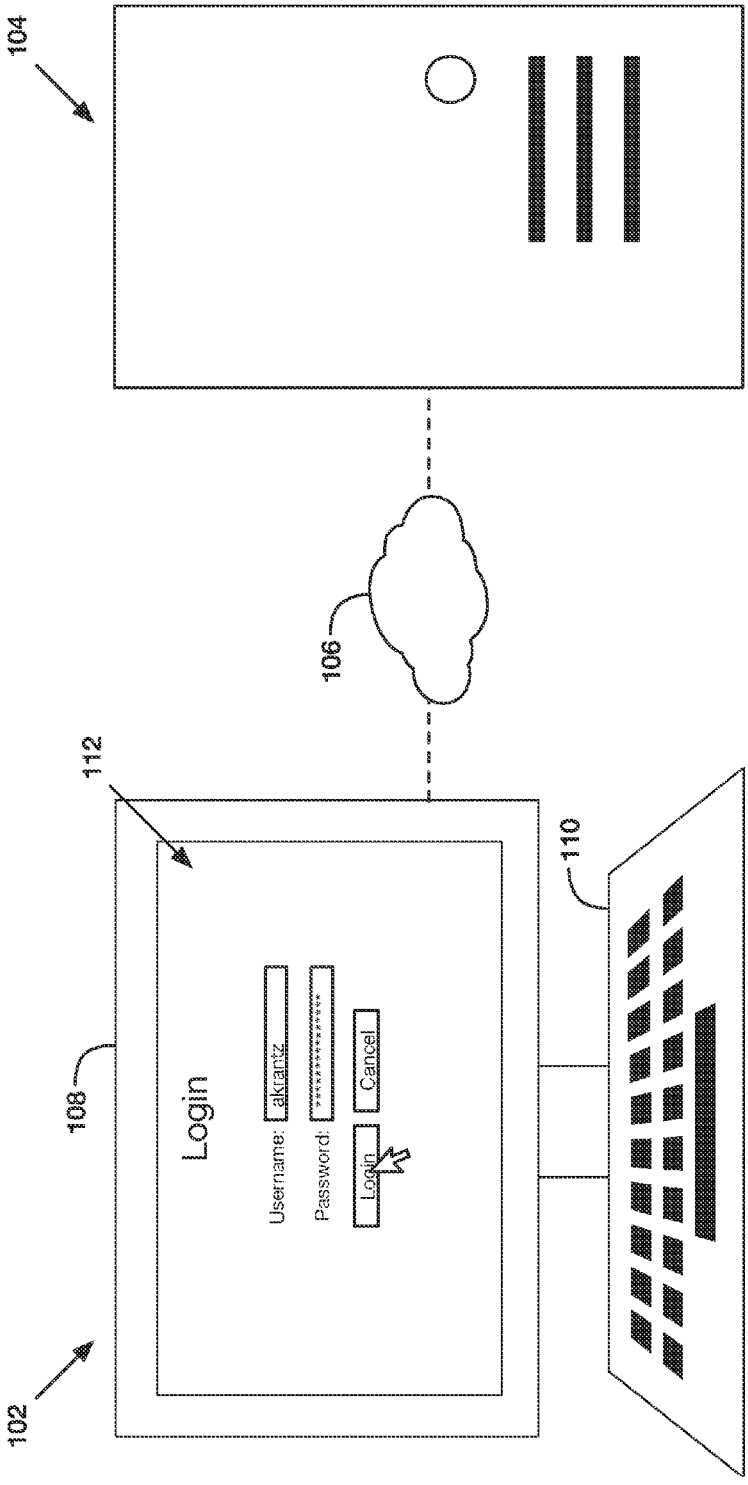
(57) **ABSTRACT**

In an embodiment, a client device receives from a server device one or more bookmark objects associated with one or more respective bookmarks to which a provided authentication credential authorizes access. Each respective bookmark is associated with a respective location in a respective document. The client device presents via a user interface one or more bookmark references corresponding to respective received bookmark objects. The client device receives via the user interface an indication of a selected bookmark reference and sends to the server device a bookmarked-document request specifying the received bookmark object corresponding to the selected bookmark reference. The client device (i) receives from the server device a bookmarked-document object that corresponds to the specified bookmark object and that includes a portion of the associated respective document at the associated respective location and (ii) presents via the user interface the included portion of the associated respective document.

20 Claims, 20 Drawing Sheets




104
106
112
108
110
102
Login
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akrantz
Password:
Cancel
Login

Fig. 1

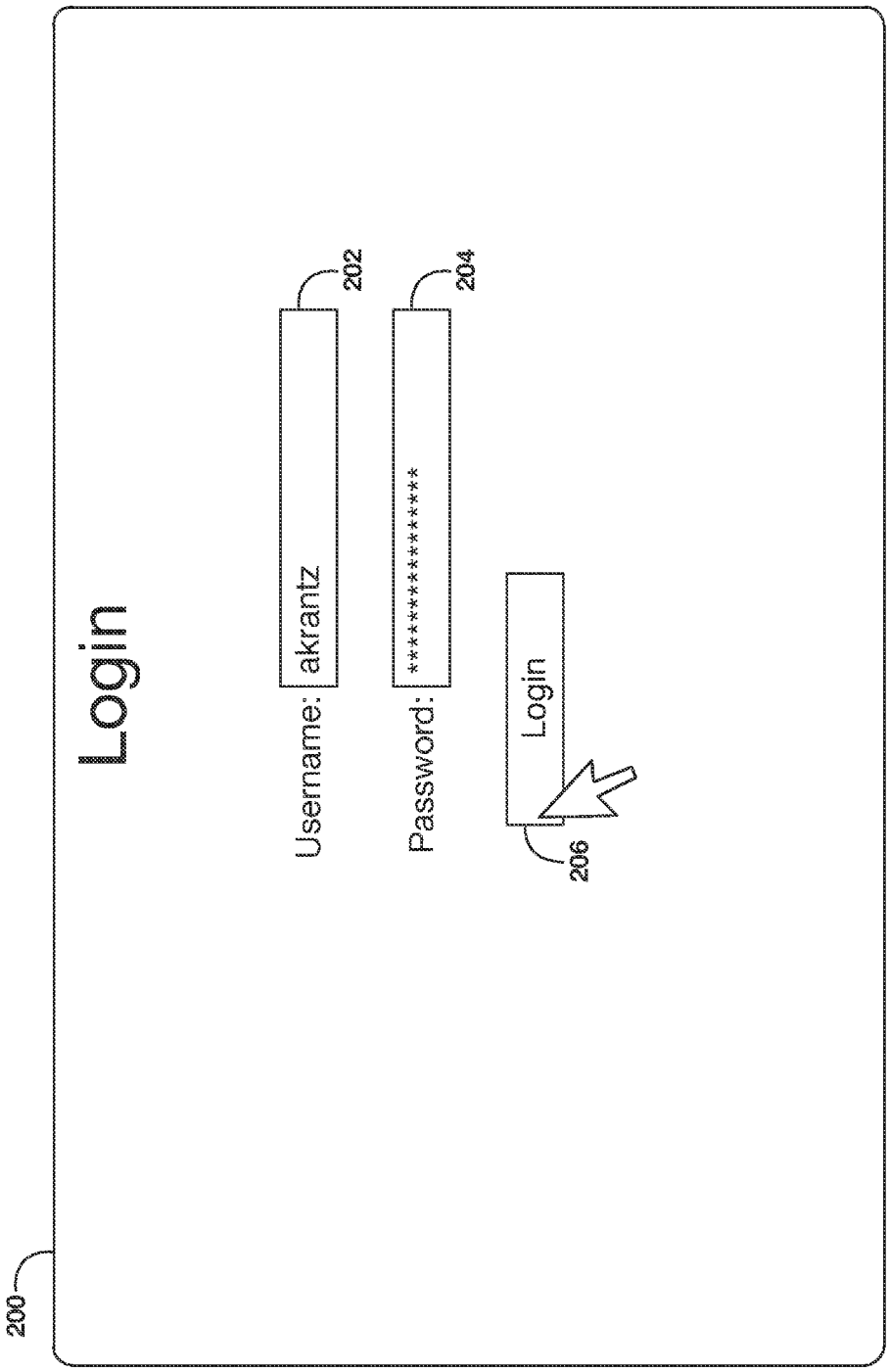


Fig. 2

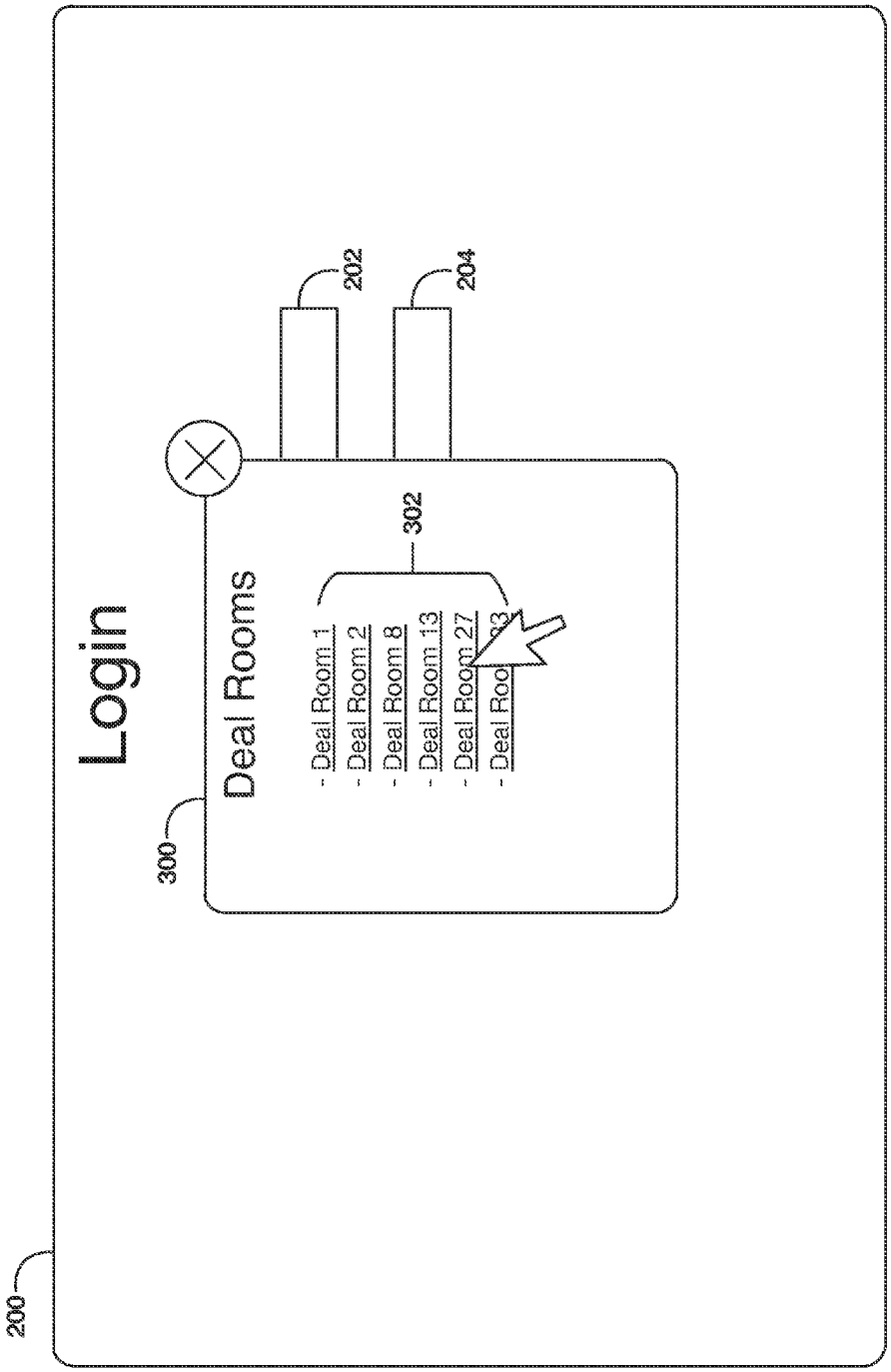
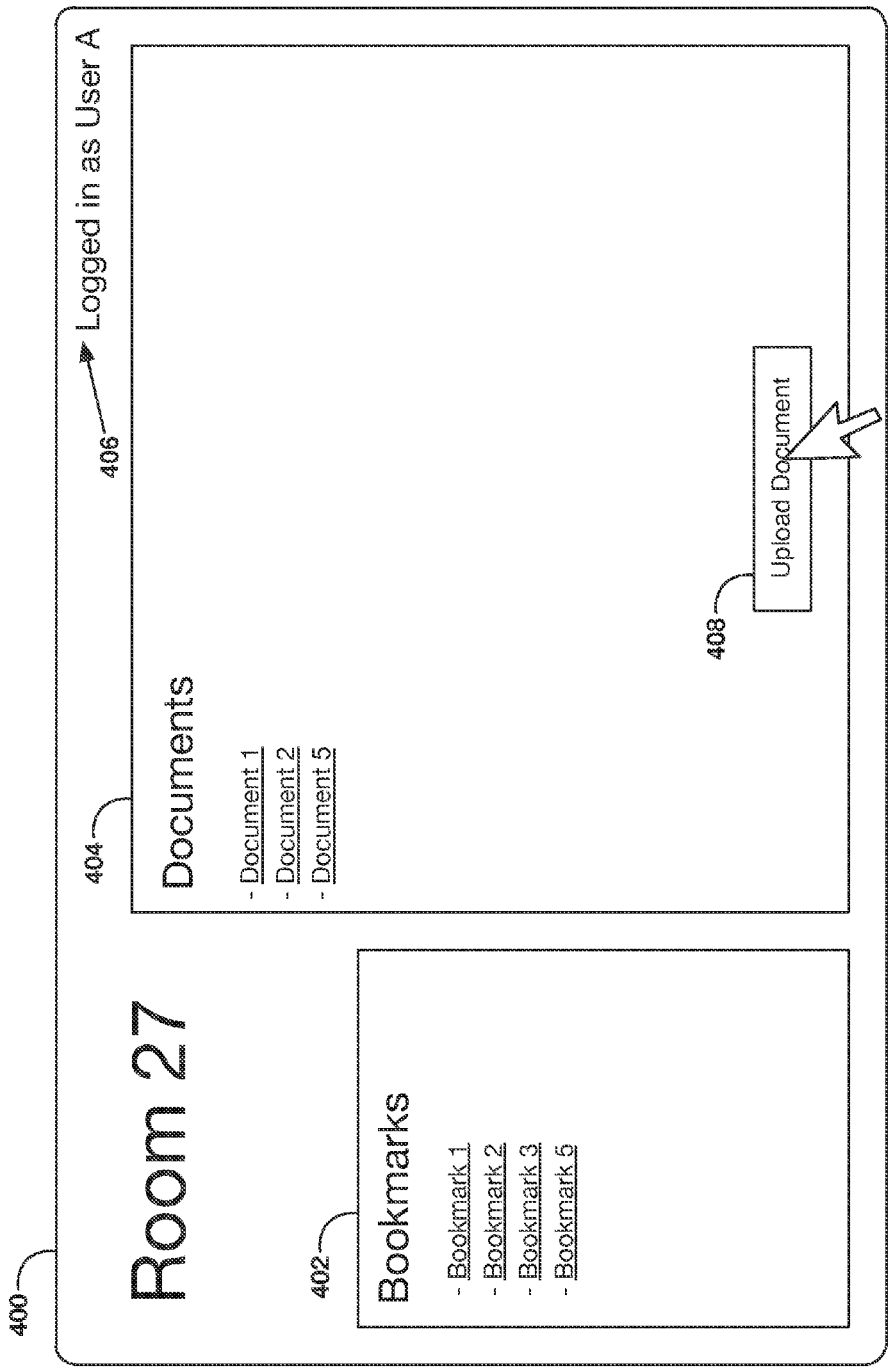

200
Login
202
204
300
Deal Rooms
302
- Deal Room 1
- Deal Room 2
- Deal Room 8
- Deal Room 13
- Deal Room 27
- Deal Roo

Fig. 3


400
Room 27
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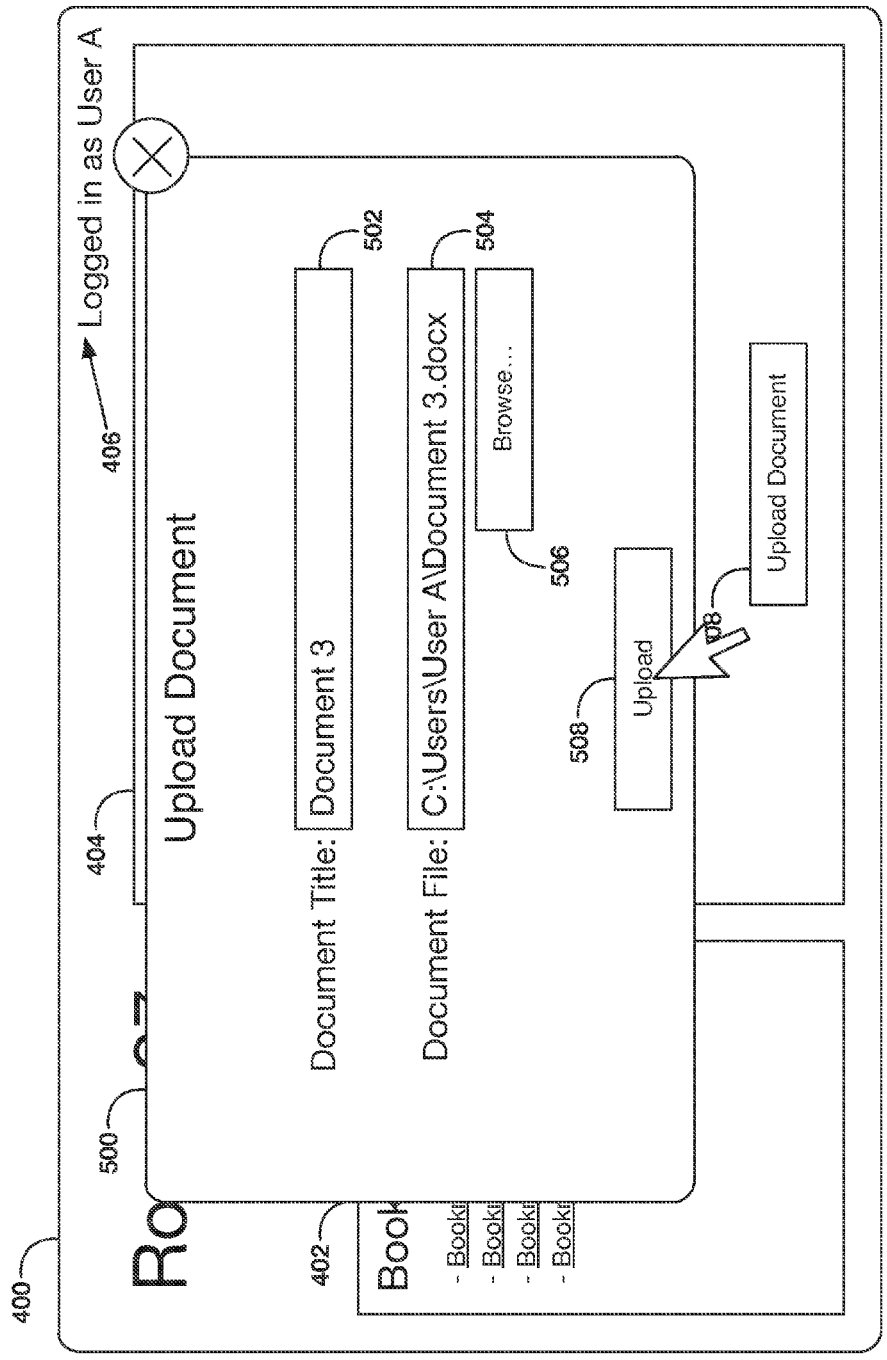
406
404
Documents
- Document 1
- Document 2
- Document 5
402
Bookmarks
- Bookmark 1
- Bookmark 2
- Bookmark 3
- Bookmark 5
408
Upload Document

Fig. 4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502
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506
508
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Upload Document
Document Title:
Document 3
Document File:
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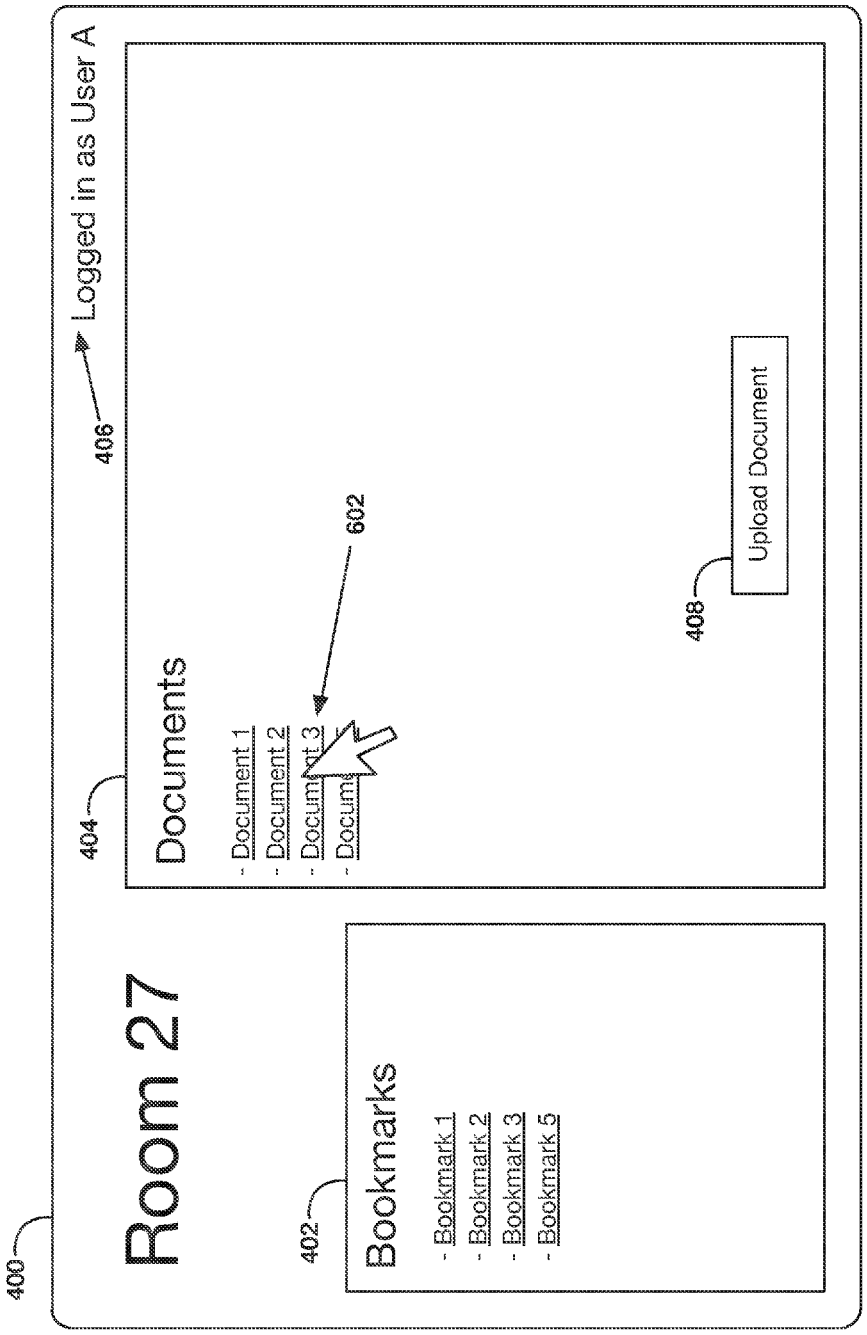
Browse...
Upload
Upload Document

Fig. 5


400
Room 27
Logged in as User A
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402
Bookmarks
- Bookmark 1
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Documents
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- Documt
602
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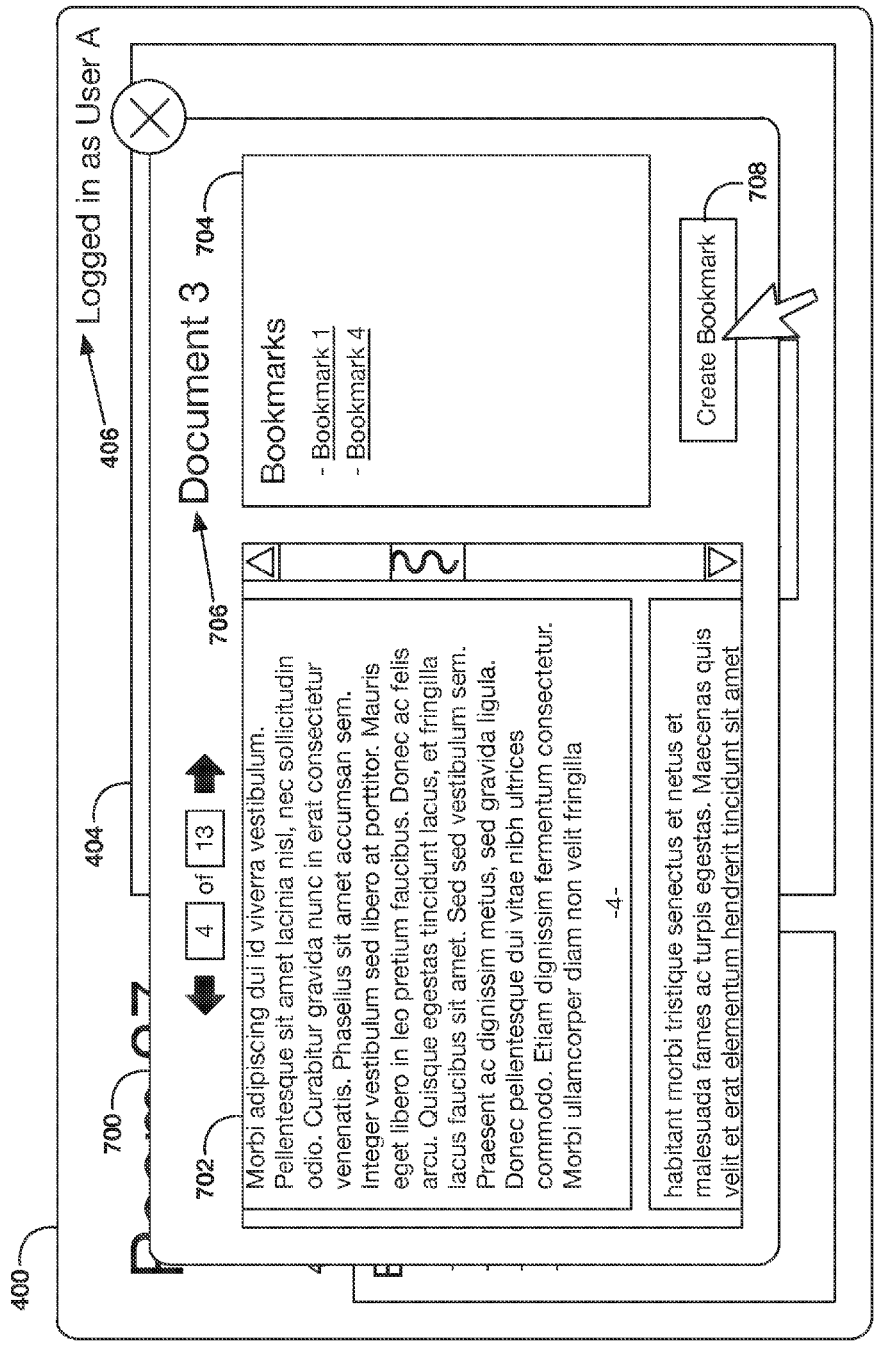
Fig. 6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700
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Document 3
704
706
Bookmarks
- Bookmark 1
- Bookmark 4
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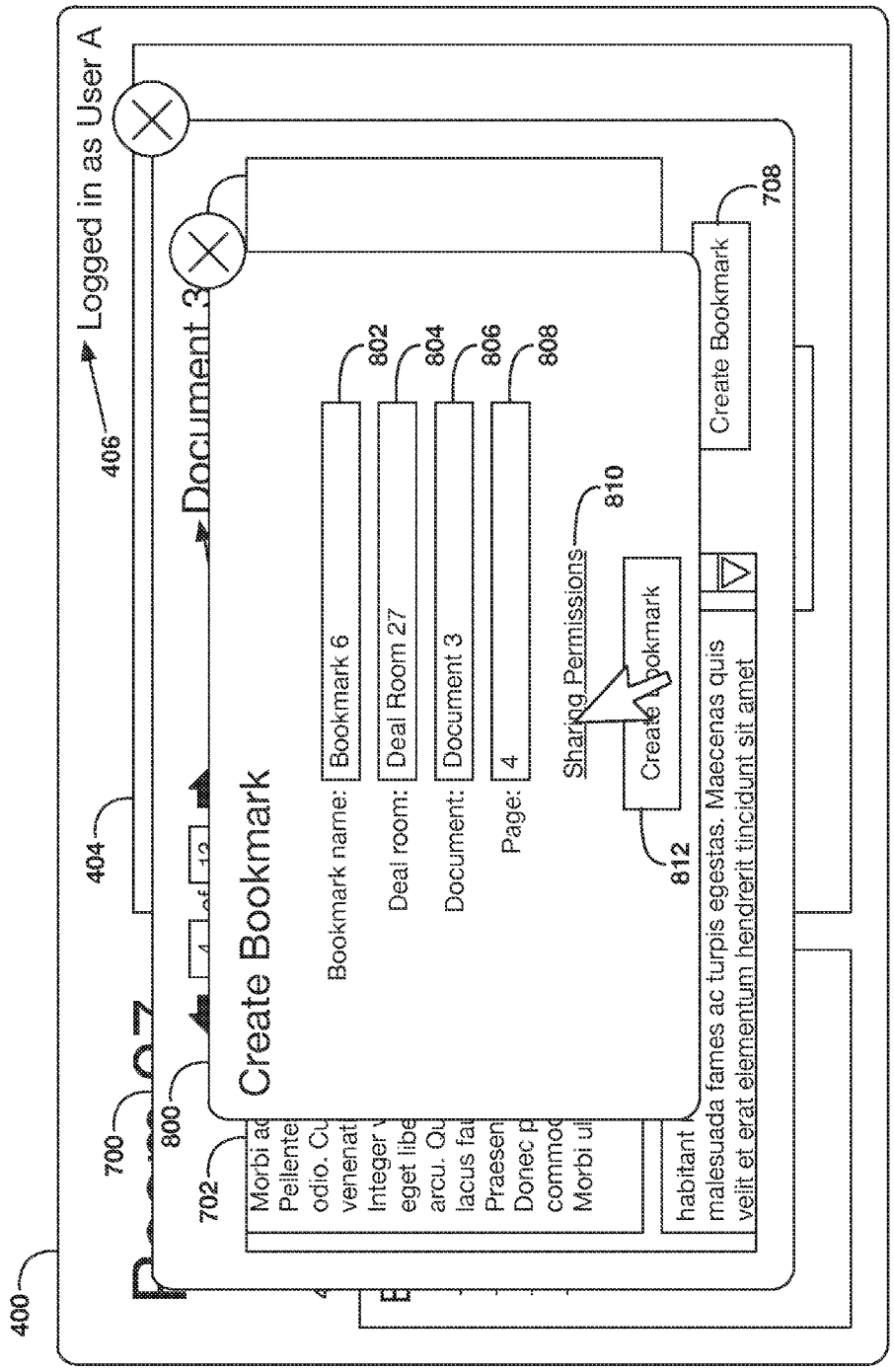
Fig. 7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702
Bookmark name:
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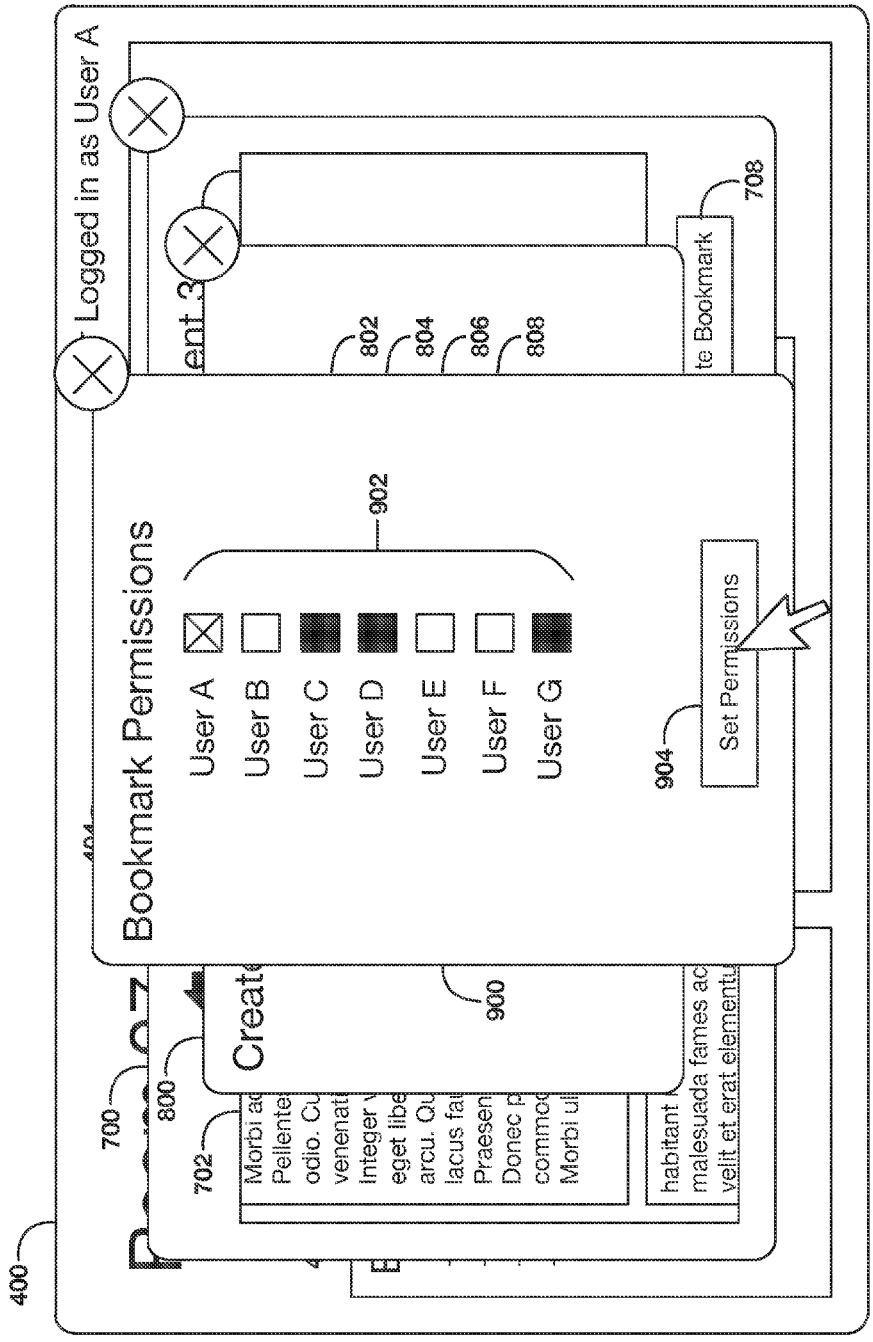
Fig. 8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Bookmark Permissions
User A
User B
User C
User D
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User F
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902
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708
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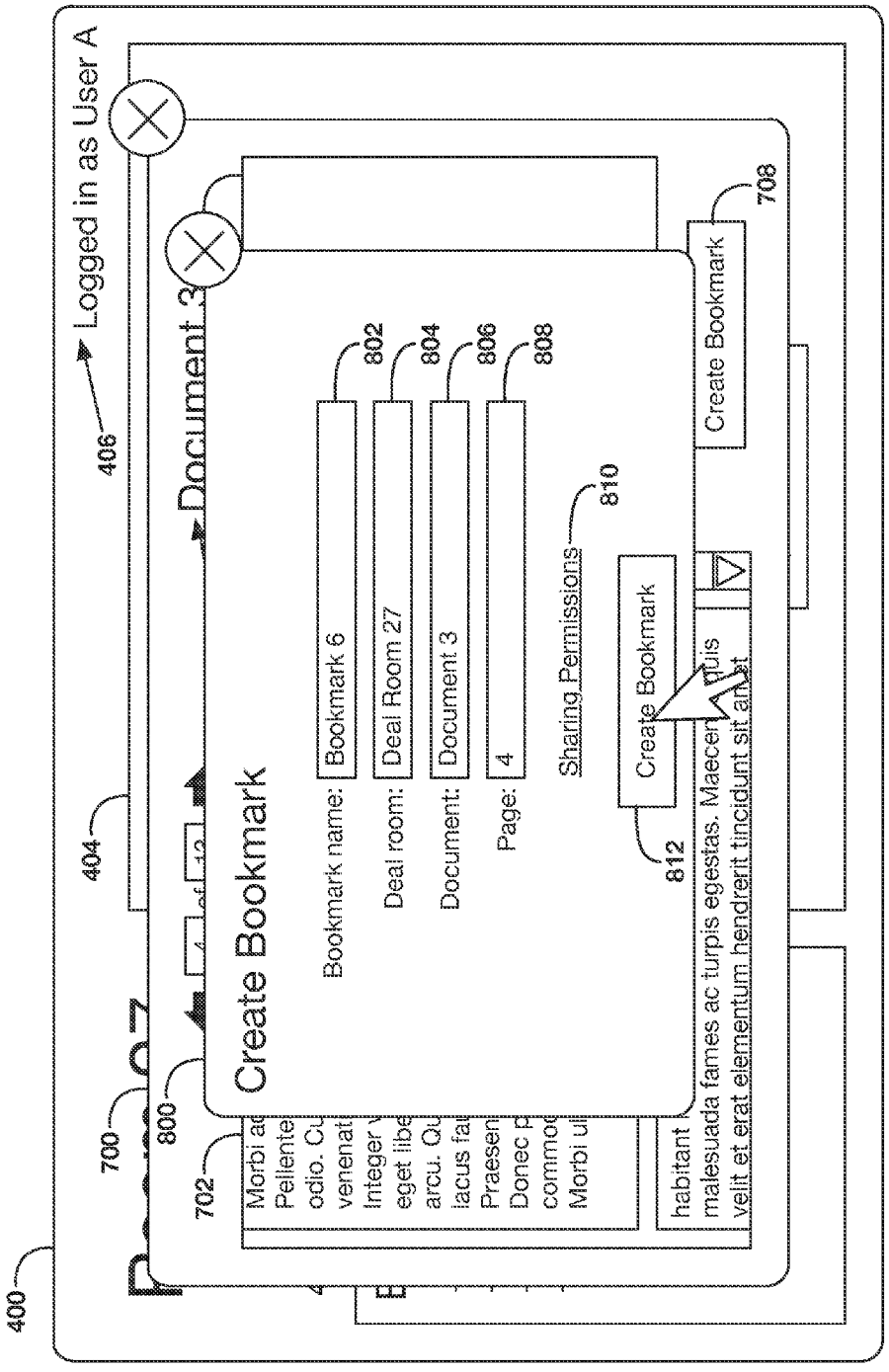
Fig. 9


400
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Document 3
700
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702
Bookmark name:
Bookmark 6
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Document:
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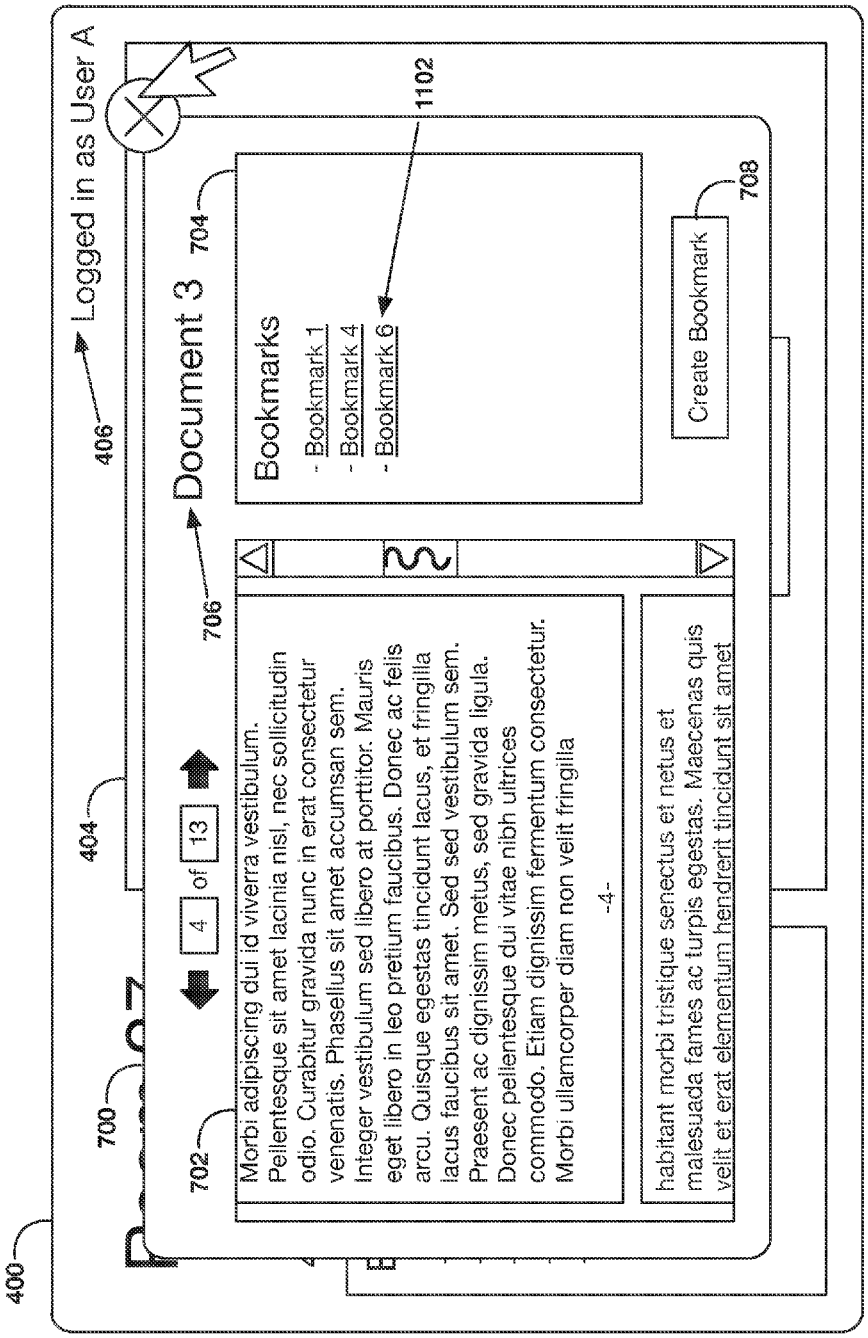
Fig. 10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Bookmarks
- Bookmark 1
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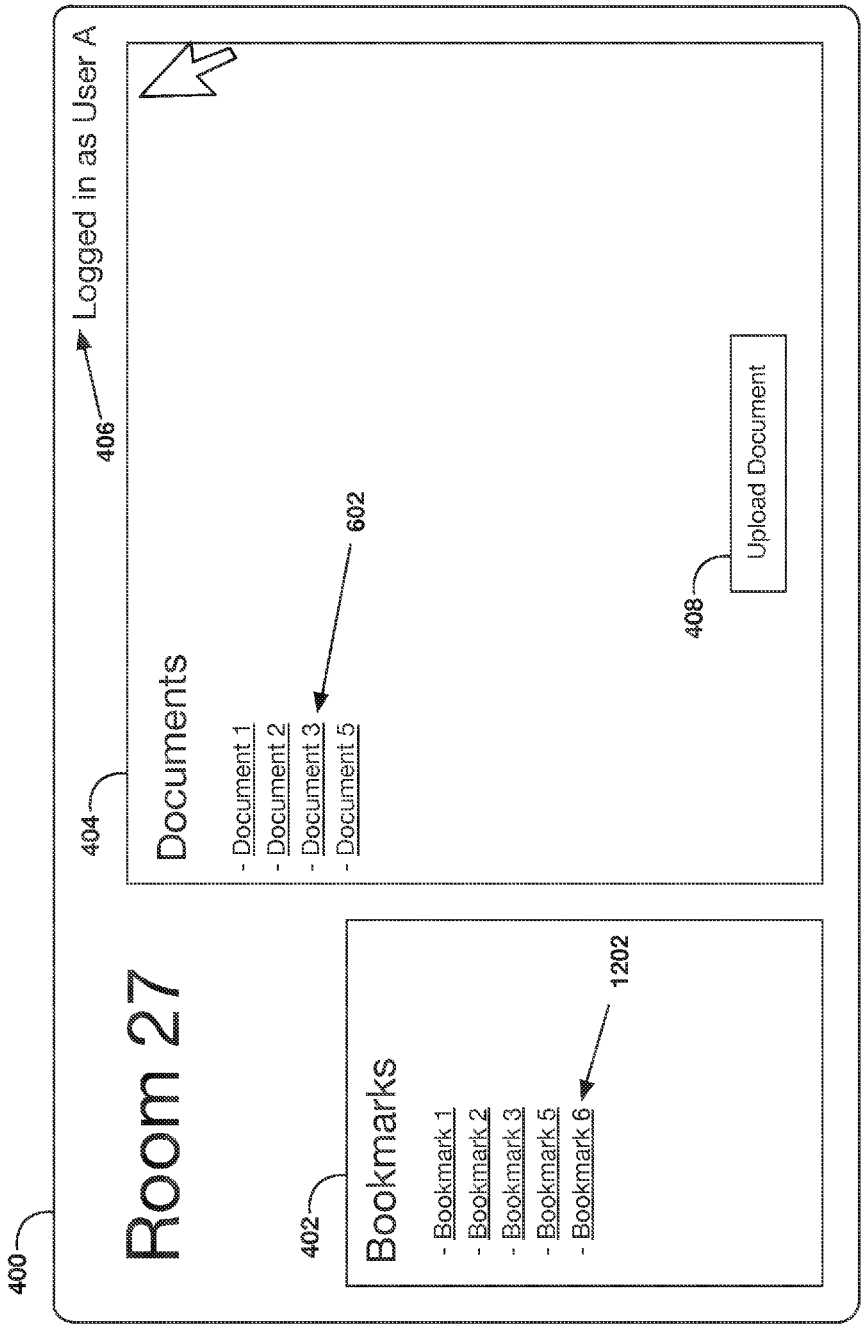
Fig. 11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Documents
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- Document 2
- Document 3
- Document 5
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Bookmarks
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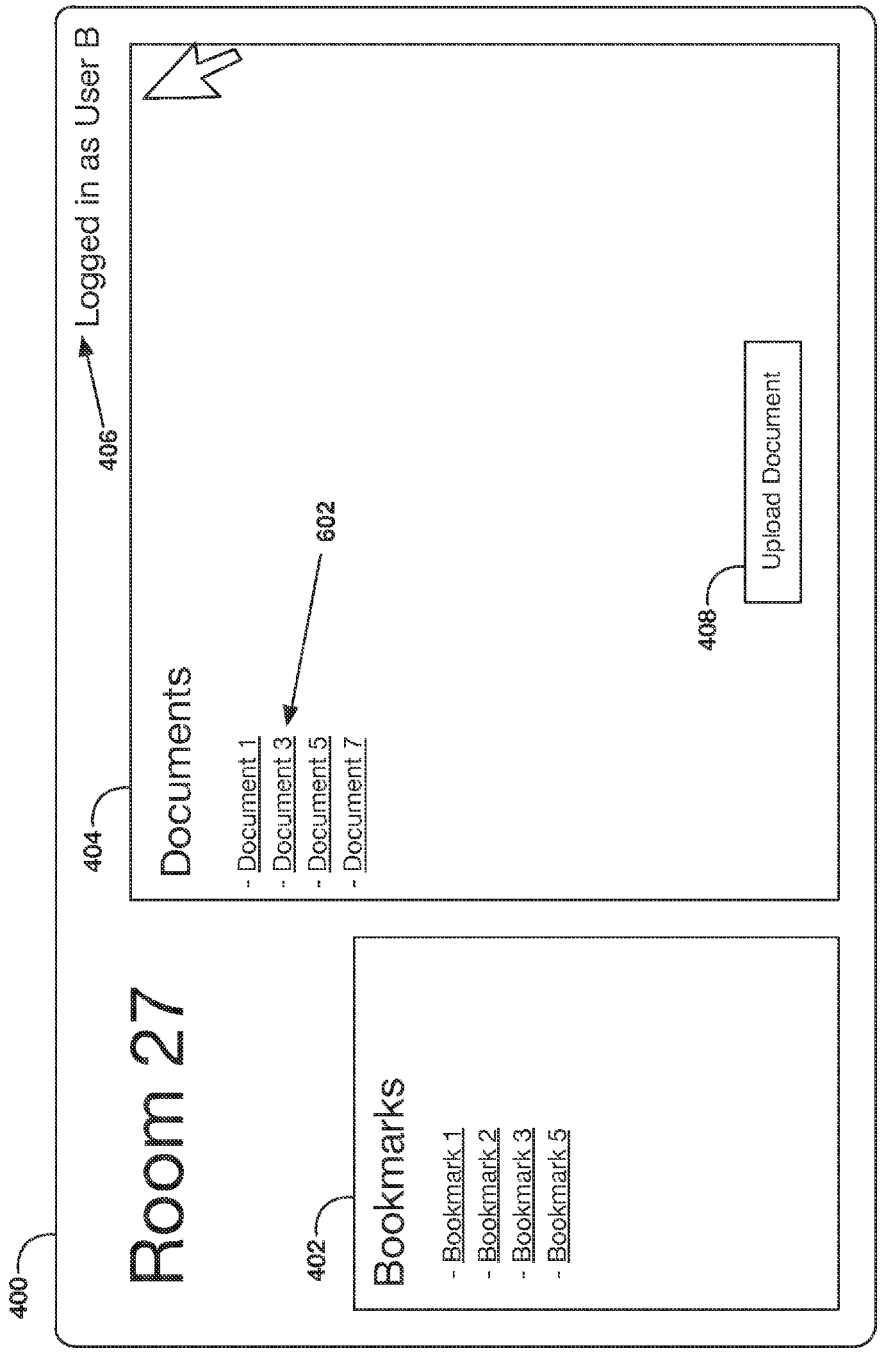
- Bookmark 2
- Bookmark 3
- Bookmark 5
- Bookmark 6
1202

Fig. 12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Bookmarks
- Bookmark 1
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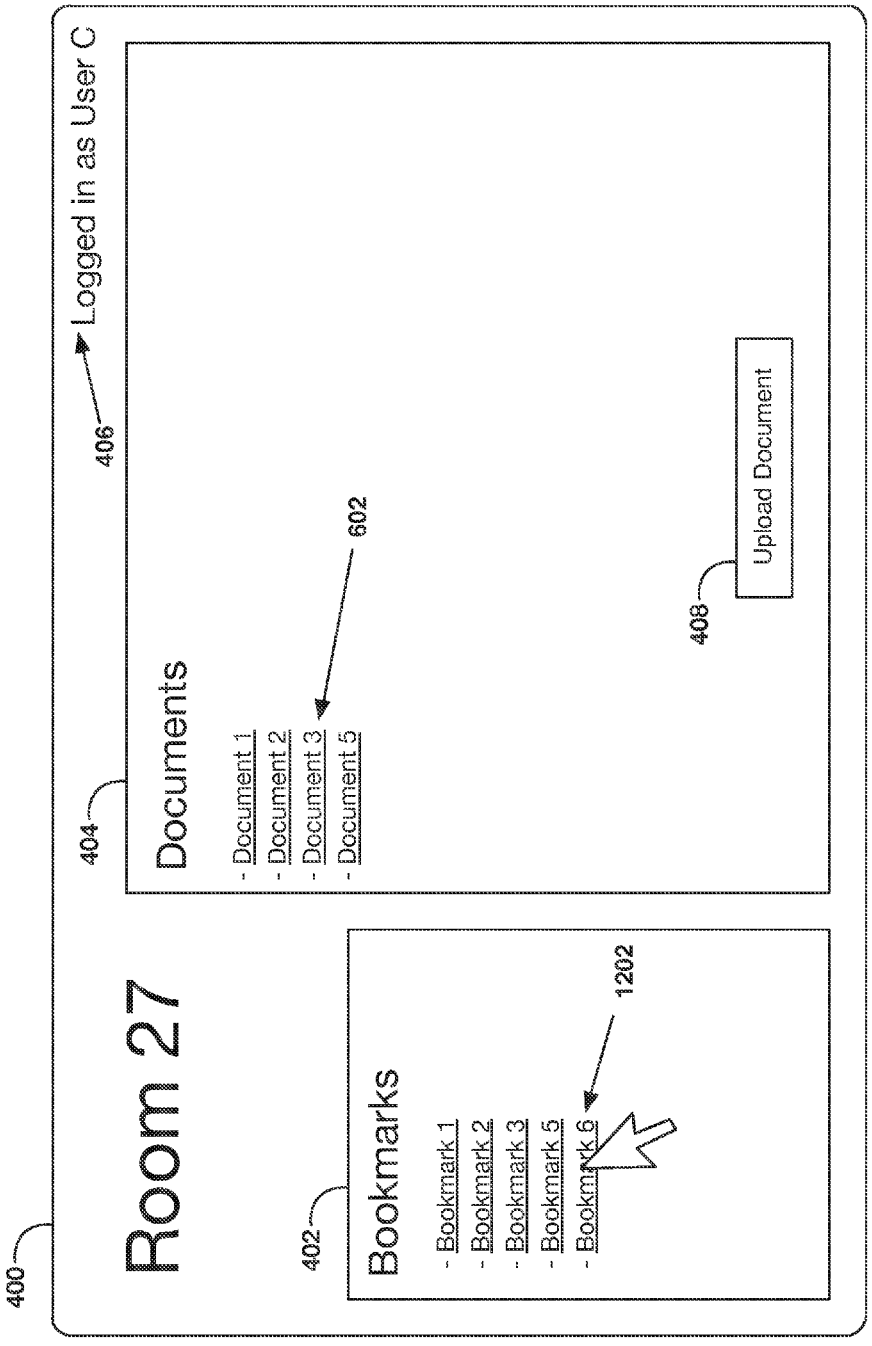
- Document 5
- Document 7
602
408
Upload Document

Fig. 13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404
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- Document 2
- Document 3
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- Bookmark 3
- Bookmark 5
- Bookmark 6
1202

Fig. 14

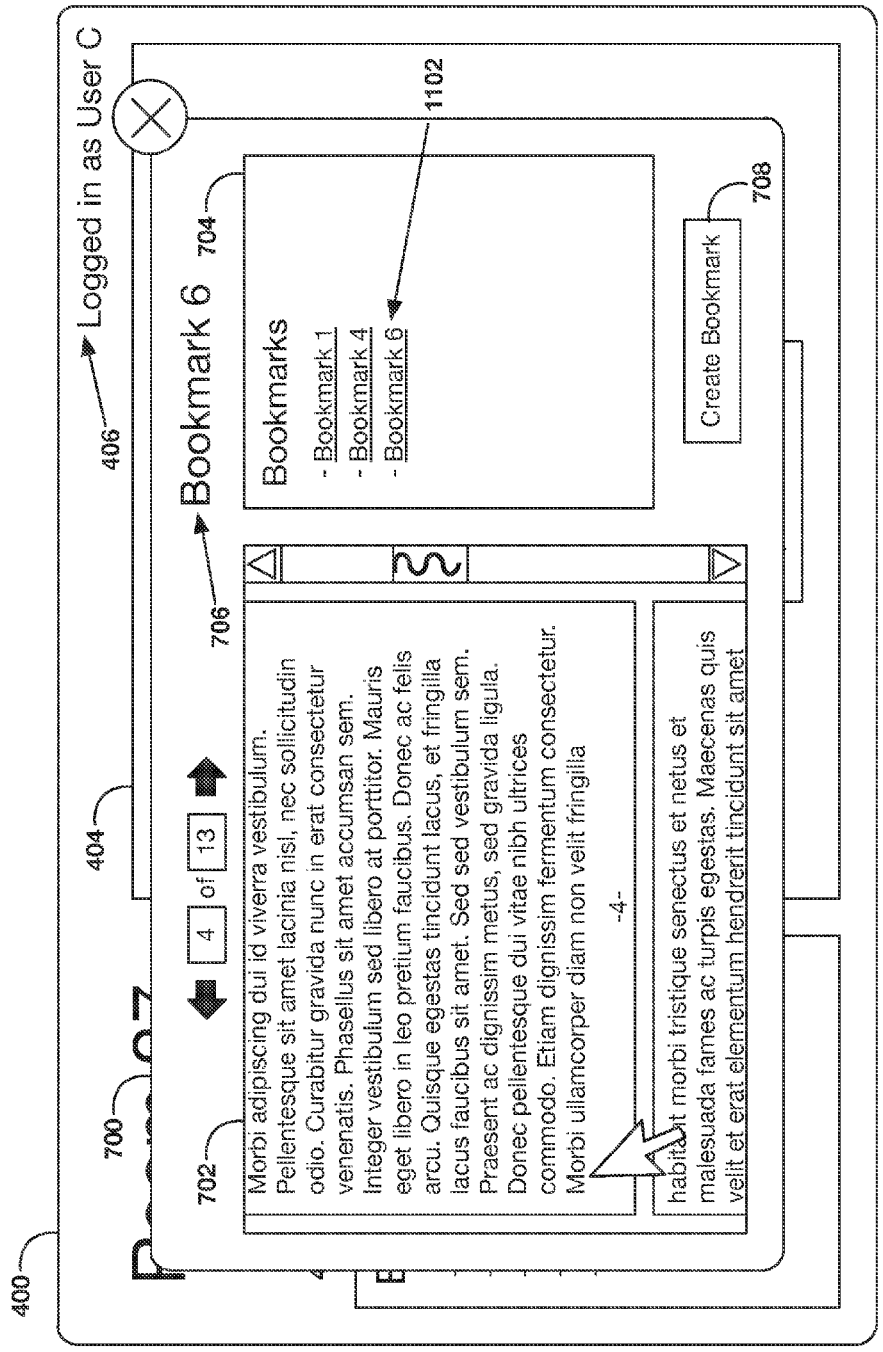
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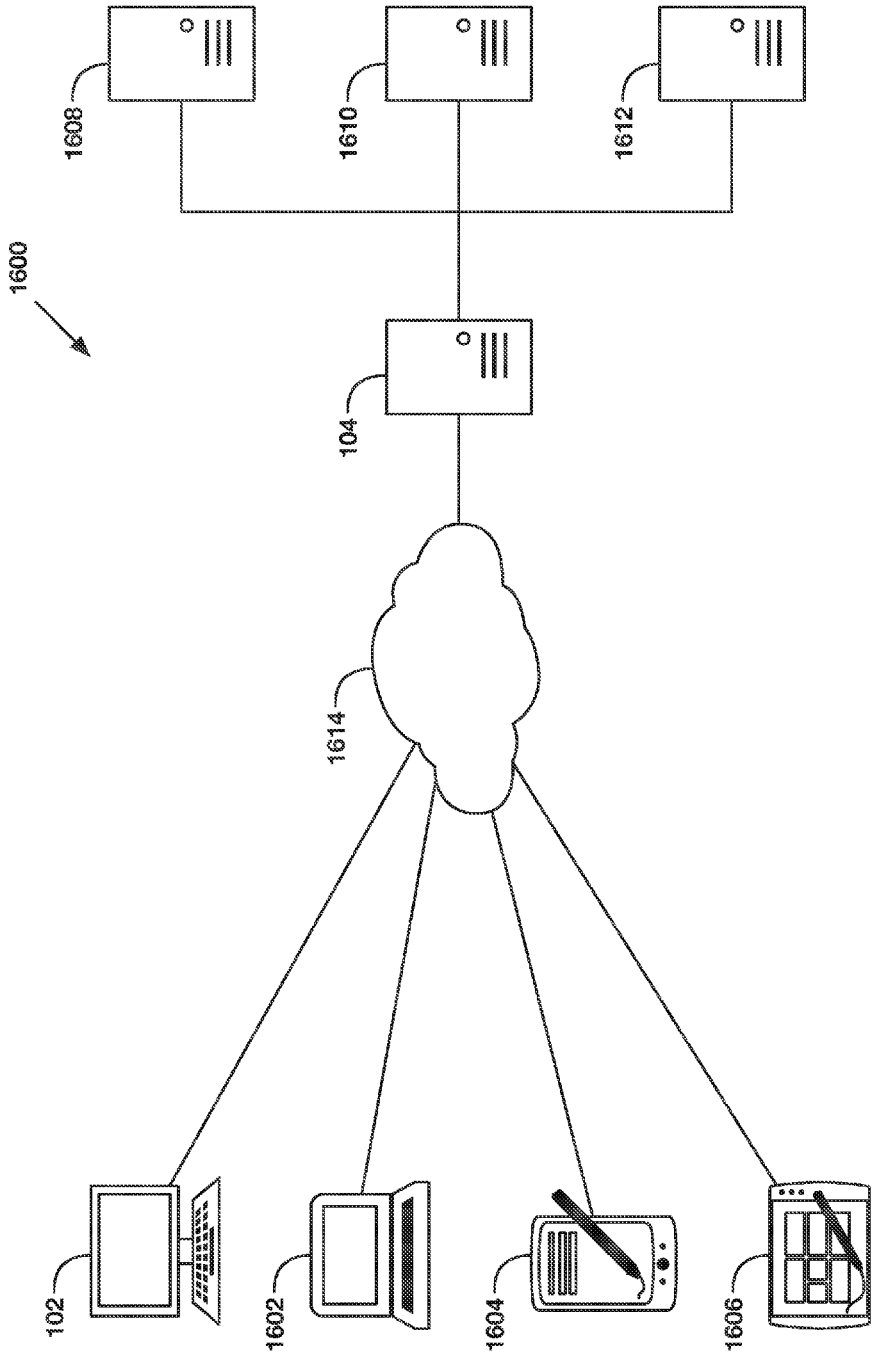
Fig. 15



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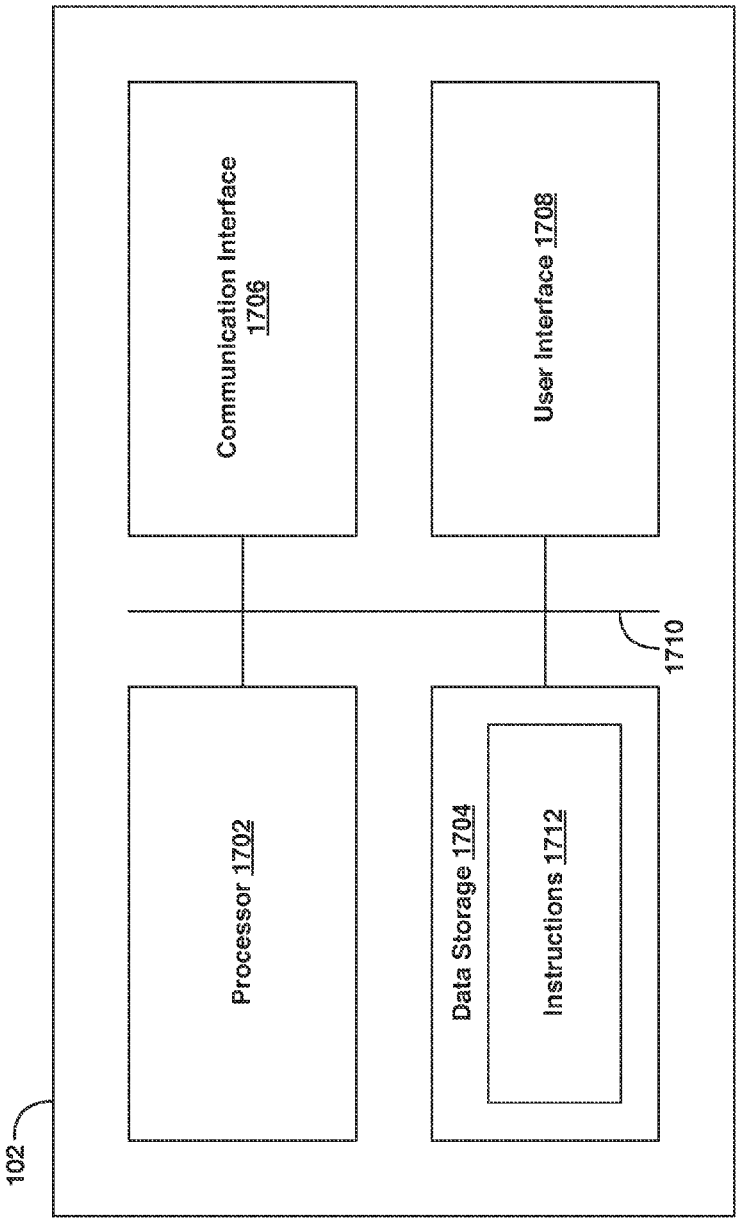
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User Interface 1708
1710
Processor 1702
Data Storage 1704
Instructions 1712
102

Fig. 17

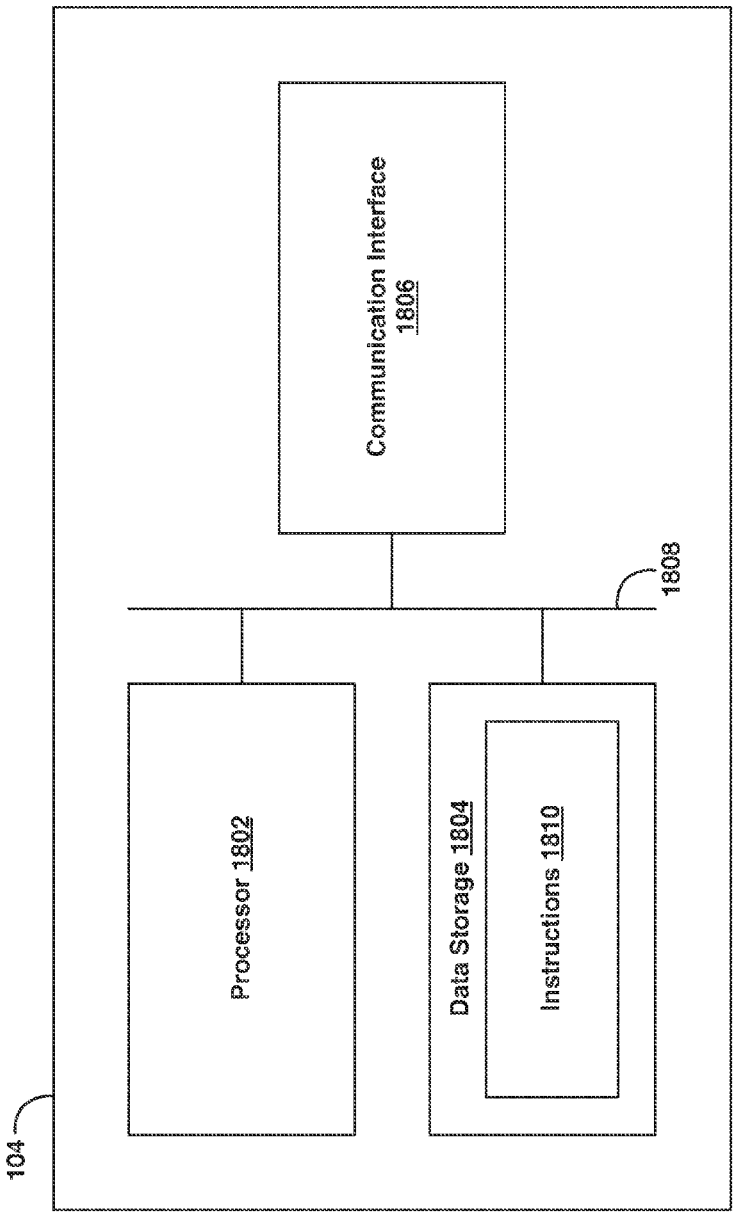
Communication Interface
1806
1808
Processor 1802
Data Storage 1804
Instructions 1810
104

Fig. 18

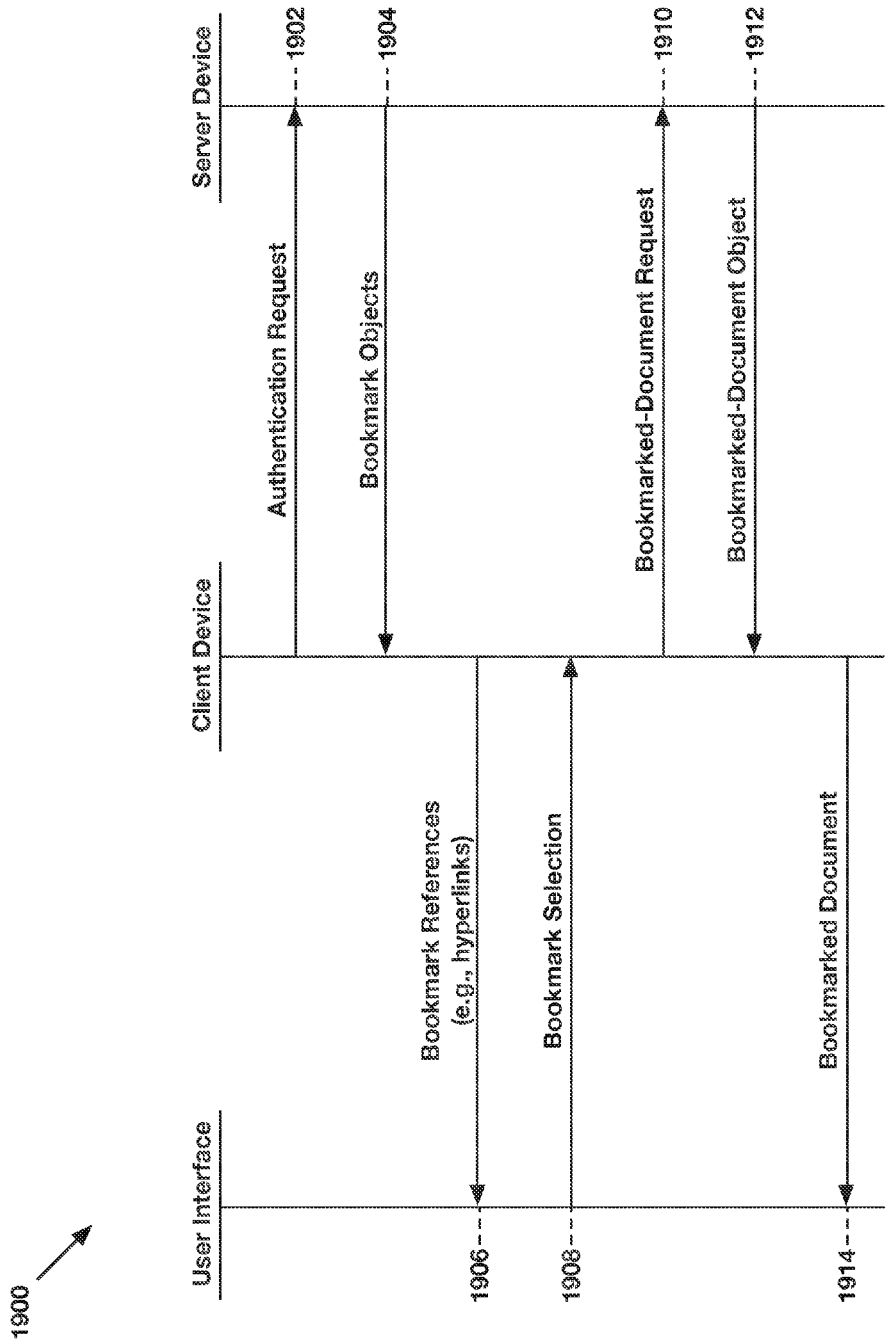
1900
User Interface
Client Device
Server Device
Authentication Request
1902
Bookmark Objects
1904
Bookmarked-Document Request
1910
Bookmarked-Document Object
1912
Bookmark References (e.g., hyperlinks)
1906
Bookmark Selection
1908
Bookmarked Document
1914

Fig. 19

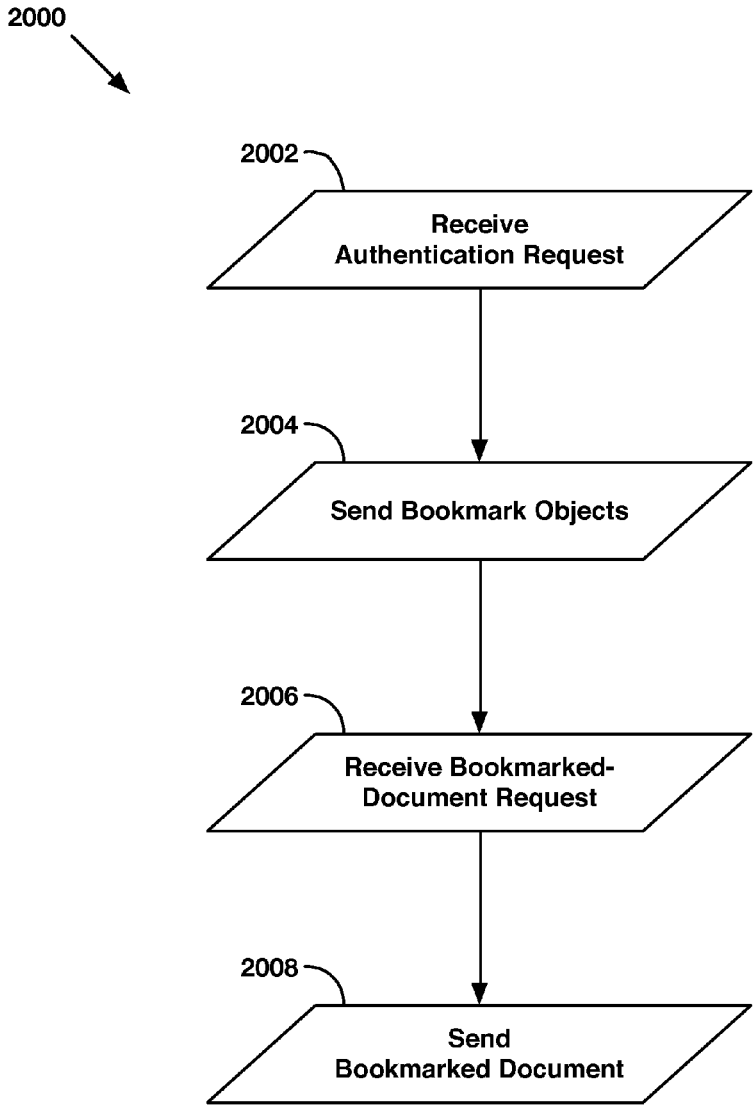
2000
2002
Receive
Authentication Request
2004
Send Bookmark Objects
2006
Receive Bookmarked-
Document Request
2008
Send
Bookmarked Document

Fig. 20

ELECTRONIC SHARED-DOCUMENT REPOSITORY

BACKGROUND

For large transactions (e.g., mergers, acquisitions, or debt or equity offerings), a "data room" or "deal room" may be established to allow interested parties and other stakeholders to review documents that may be relevant to the transaction. A traditional data room may be a physically-secure, continuously-monitored room or other space provided by one of the parties to the transaction. Corporate officers, attorney, and other individuals may travel (often over long distances) to the location of the data room to review hardcopy documents stored in the data MOM.

SUMMARY

A virtual data room may reduce or eliminate costs typically associated with traditional deal rooms. By providing access to relevant documents via the Internet, hardcopies of documents and travel to a physical deal room to review those hardcopies becomes unnecessary.

While virtual data rooms may reduce costs, they may also restrict the ability of individuals reviewing the relevant documents to collaborate amongst each other. The review of the documents becomes a solitary task, with each individual reviewing documents at his or her own computer. Sharing documents and identifying specific locations in documents becomes more difficult than were the individuals to collaborate in a physical data room.

Described herein are various embodiments for an electronic shared-document repository. In an embodiment, a client device sends to a server device an authentication request comprising an authentication credential associated with a user of an electronic-document repository. The client device receives from the server device one or more bookmark objects associated with one or more respective bookmarks to which the authentication credential authorizes access. Each respective bookmark is associated with a respective location in a respective document, and one or more of the bookmarks have been generated by one or more other users of the electronic-document repository. The client device presents via a user interface one or more bookmark references corresponding to respective received bookmark objects. The client device receives via the user interface an indication of a selected bookmark reference and sends to the server device a bookmarked-document request specifying the received bookmark object corresponding to the selected bookmark reference. The client device (i) receives from the server device a bookmarked-document object that corresponds to the specified bookmark object and that includes a portion of the associated respective document at the associated respective location and (ii) presents via the user interface the included portion of the associated respective document.

In an embodiment, a server device (i) receives from a client device an authentication request comprising an authentication credential associated with a user of an electronic-document repository and (ii) sends to the client device one or more bookmark objects associated with respective bookmarks to which the authentication credential authorizes access. Each respective bookmark is associated with a respective location in a respective document, and one or more of the bookmarks have been generated by one or more other users of the electronic-document repository. The server device (i) receives from the client device a bookmarked-document request specifying a respective bookmark object and (ii) sends to the client device a bookmarked-document object that corresponds to the specified bookmark object and that includes a portion of the associated respective document at the associated respective location.

These as well as other aspects, advantages, and alternatives will become apparent to those of ordinary skill in the art by reading the following detailed description, with reference where appropriate to the accompanying drawings. Further, it should be understood that the descriptions provided in this overview and below are intended by way of example and not limitation.

BRIEF DESCRIPTION OF THE DRAWINGS

Various example embodiments are described herein with reference to the following drawings, in which like numerals denote like entities, and in which:

FIG. **1** illustrates respective client and server devices, in accordance with various embodiments;

FIG. **2** illustrates a login interface, in accordance with various embodiments;

FIG. **3** illustrates a deal room selection interface, in accordance with various embodiments;

FIG. **4** illustrates a bookmark/document selection interface, in accordance with various embodiments;

FIG. **5** illustrates a document upload interface, in accordance with various embodiments;

FIG. **6** illustrates the bookmark/document selection interface after upload of a document via the document upload interface of FIG. **5**, in accordance with various embodiments;

FIG. **7** illustrates a document presentation interface, in accordance with various embodiments;

FIGS. **8** and **10** illustrate a bookmark creation interface, in accordance with various embodiments;

FIG. **9** illustrates a bookmark permission assignment interface, in accordance with various embodiments;

FIG. **11** illustrates the document presentation interface of FIG. **7** after creation of a bookmark, in accordance with various embodiments;

FIG. **12** illustrates a bookmark/document selection interface after creation of a bookmark, in accordance with various embodiments;

FIG. **13** illustrates a bookmark/document selection interface for a second user of the electronic-document repository, in accordance with various embodiments;

FIG. **14** illustrates a bookmark/document selection interface for a third user of the electronic-document repository, in accordance with various embodiments;

FIG. **15** illustrates the document presentation interface of FIG. **7** after user selection of a bookmark reference, in accordance with various embodiments;

FIG. **16** illustrates a computer network, in accordance with various embodiments;

FIG. **17** is a block diagram of the hardware a client device, in accordance with various embodiments;

FIG. **18** is a block diagram of the hardware of a server device, in accordance with various embodiments;

FIG. **19** is a sequence diagram of a method, in accordance with various embodiments; and

FIG. **20** is a flowchart of a method, in accordance with various embodiments.

DETAILED DESCRIPTION

The present systems and methods will now be described with reference to the figures. It should be understood, however, that numerous variations from the depicted arrange-

ments and functions are possible while remaining within the scope and spirit of the claims. For instance, one or more elements may be added, removed, combined, distributed, substituted, re-positioned, re-ordered, and/or otherwise changed. Further, where this description refers to one or more functions being implemented on and/or by one or more devices, one or more machines, and/or one or more networks, it should be understood that one or more of such entities could carry out one or more of such functions by themselves or in cooperation, and may do so by application of any suitable combination of hardware, firmware, and/or software. For instance, one or more processors may execute one or more sets of programming instructions as at least part of carrying out of one or more of the functions described herein.

I. EXAMPLE CLIENT AND SERVER DEVICES

FIG. **1** illustrates respective client and server devices, in accordance with various embodiments. As shown in FIG. **1**, a client device **102** is communicatively connected to a server device **104** via a wide-area network (WAN) **106** (e.g., the Internet).

Client device **102** may be any device capable of performing the client-device functions described herein. In an embodiment illustrated in FIG. **1**, the client device takes the form of a desktop computer that includes a computer monitor **108** and a computer keyboard **110**. The computer executes a web browser that presents an interface **112** to an electronic shared-document repository via the computer monitor. Client device **102** may take other forms as well, as will be described below.

In an embodiment, the web browser of client device **102** communicates (via WAN **106**) with server device **104**, which may be any device capable of performing the server-device functions described herein. The server device may execute a web server, a database server, a file server, and/or various other server applications. Server device **104** may take other forms as well, as will be described below.

II. EXAMPLE REPOSITORY INTERFACE

FIGS. **2** through **15** illustrate an interface of an electronic shared-document repository, in accordance with various embodiments. The repository interface is described below as being presented via a web browser of client device **102**; however, those having skill in the art will recognize that the repository interface may be presented in other ways as well.

FIG. **2** illustrates a login interface, in accordance with various embodiments. As shown in FIG. **2**, the login interface **200** includes a username input field **202**, a password input field **204**, and a login button **206**. In an embodiment, the login interface is configured to receive a username and a password of a repository user via fields **202** and **204**, respectively. The login interface sends the username and password to server device **104** in response to receiving a user selection of login button **206**.

FIG. **3** illustrates a deal room selection interface, in accordance with various embodiments. The deal room selection interface **300** may be presented upon server device **104** successful authenticating the repository user (based on the username and password provided via login interface **200**).

As shown in FIG. **3**, the deal room selection interface **300** includes a list **302** of one or more deal rooms of the repository. In an embodiment, access to a respective deal room is restricted to a respective group of authorized users. The creator of the deal room or an administrator of the repository may specify the authorized users for a respective deal room (as examples). The group of authorized users may be specified, for example, when the deal room is initially created, and the group of authorized users may be modified after creation of the deal room, among other variations. List **302** of deal rooms may list only those rooms that the user has been authorized to access.

FIG. **4** illustrates a bookmark/document selection interface, in accordance with various embodiments. The selection interface **400** may be presented in response to user selection of a deal room referenced in list **302**. As shown in FIG. **4**, the selection interface **400** includes a list of documents **402** and a list of bookmark **404**. The interface further includes an indication **406** of the user that was authenticated via interface **200**, as well as an upload document button **408**.

FIG. **5** illustrates a document upload interface, in accordance with various embodiments. The document upload interface **500** may be presented in response to user selection of upload button **408**, for example. As shown in FIG. **5**, the document upload interface **500** includes a document title field **502**, a document file field **504**, a browse button **506**, and an upload button **508**. In an embodiment, the upload interface is configured to receive a title and a location of a document to be uploaded to the repository via fields **502** and **504**, respectively. The upload interface presents a file-selection interface in response to user selection of browse button **506** and populates document file field **504** with the location of a file selected via the file-selection interface. The upload interface sends both the specified title and the document present at the specified location to server device **104** in response to receiving a user selection of upload button **508**.

FIG. **6** illustrates the bookmark/document selection interface after upload of a document via the document upload interface, in accordance with various embodiments. As shown in FIG. **6**, document list **404** includes a reference **602** to the document uploaded via document upload interface **500**.

FIG. **7** illustrates a document presentation interface, in accordance with various embodiments. The document presentation interface **700** may be presented in response to user selection of a reference to a bookmark and/or a document in respective lists **402** and **404**, for example. In the embodiment illustrated in FIG. **7**, the document presentation interface is presented in response to user selection of reference **602** to document 3 presented in list **404**.

As shown in FIG. **7**, the document presentation interface **700** includes a presentation **702** of a respective document and a list of bookmarks **704** associated with respective locations in the document. The interface further includes a header **706** identifying the presented document, as well as a create bookmark button **708**.

FIG. **8** illustrates a bookmark creation interface, in accordance with various embodiments. The bookmark creation interface **800** may be presented in response to user selection of create bookmark button **708**, for example. As shown in FIG. **8**, bookmark creation interface **800** includes a bookmark name field **802**, a deal room field **804**, a document field **806**, and a page field **808**. The interface further includes a permissions hyperlink **810** and a create button **812**.

In an embodiment, the bookmark creation interface is configured to receive a bookmark name and an identifier of a repository deal room via fields **802** and **804**, respectively. The bookmark creation interface is further configured to receive an identifier of a repository document and a reference to a location in that repository document via fields **806** and **808**, respectively. The identifiers of the deal room and the document could be the respective names of the room and document, for example. The identifiers could take other forms as well. Fields **804** and **806** could be automatically populated with the identifiers of the deal room selected via deal room

selection interface **300** and the document selected via bookmark/document selection interface **400**, respectively. Additionally or alternatively, fields **804** and **806** could receive user entry of the deal room identifier and/or the document identifier. Field **808** could be automatically populated with the location in the document presented via document presentation interface **700** at the time of user selection of create bookmark button **708**. As another possibility, field **808** could receive user entry of a respective location in the presented document.

FIG. **9** illustrates a bookmark permission assignment interface, in accordance with various embodiments. The bookmark permission assignment interface **900** may be presented in response to user selection of permissions hyperlink **810**, for example. As shown in FIG. **9**, bookmark permission assignment interface **900** includes a list of users **902** of the electronic shared-document repository and respective checkboxes next to each listed user. Interface **900** further includes a set permissions button **904**. A respective checkbox may be configured to receive user selection of the given checkbox and to responsively toggle both (i) selection of the respective user indicated next to the respective checkbox and (ii) presentation of a solid black box in the respective checkbox. Interface **900** may require selection of one or more users—e.g., the user that is attempting to create a bookmark. The interface may automatically make the required selections and may indicate, e.g., by presentation of a checkmark in the checkbox next to the respective user (such as the checkmark in FIG. **9** next to user A attempting to create the bookmark), that the required selections have been made.

FIG. **10** illustrates bookmark creation interface **800** as presented in response to detecting user selection of set permissions button **904**. Interface **900** may be configured to send a request to server device **104** to create a bookmark in response to detecting user selection of create bookmark button **812**. The request may include the received (or auto-populated) values of one or more of fields **802** through **808**, as well as respective value indicating respective users selected via permission assignment interface **900**. In response to receiving the request, server device **104** may create a bookmark based on the values in the received request.

FIGS. **11** and **12** illustrate the document presentation interface and the bookmark/document selection interface, respectively, after creation of a bookmark, in accordance with various embodiments. As shown in FIG. **11**, document presentation interface **800** includes a reference **1102** to the bookmark created via bookmark creation interface **800**. As shown in FIG. **12**, document presentation interface **800** includes a reference **1202** to the bookmark created via bookmark creation interface **800**.

FIG. **13** illustrates a bookmark/document selection interface for a second user B of the electronic-document repository, in accordance with various embodiments. As illustrated in FIG. **13**, a user B has been authenticated to the electronic shared-document repository (as shown by indication **406**). Document list **404** includes reference **602** to document 3 uploaded by user A via document upload interface **500**. However, bookmark list **402** does not include reference **1202** to bookmark 6 because, as shown in FIG. **9**, user B was not selected in bookmark permission assignment interface **900** when bookmark 6 was created via bookmark creation interface **800**.

FIG. **14** illustrates a bookmark/document selection interface for a third user C of the electronic-document repository, in accordance with various embodiments. As illustrated in FIG. **14**, a user C has been authenticated to the electronic shared-document repository (as shown by indication **406**), and document list **404** includes reference **602** to document 3 uploaded by user A via document upload interface **500**. As shown in FIG. **9**, user C was selected in bookmark permission assignment interface **900** when bookmark 6 was created via bookmark creation interface **800**. Accordingly, unlike the bookmark list presented to user B, bookmark list **402** presented to user C includes reference **1202** to bookmark 6.

FIG. **15** illustrates document presentation interface **700** after user selection of reference **1202** to bookmark 6, in accordance with various embodiments. As shown in FIG. **15**, header **706** identifies the content of presentation **702** as bookmark 6. Document 6 is presented in presentation **702** at the location associated with bookmark 6—namely, page 4.

III. EXAMPLE ARCHITECTURE

FIG. **16** illustrates a computer network, in accordance with various embodiments. As shown in FIG. **16**, network **1600** includes client devices **102** and **1602** through **1606**, server devices **104** and **1608** through **1612**, and the Internet **1614**. The client devices are connected to the Internet **1614** via respective communication links and server device **104** is connected to the Internet **1614** via a respective communication link. Server devices **104** and **1608** through **1612** are interconnected via respective communication links.

Client devices **102** and **1602** through **1606** could be any devices capable of performing the client-device functions described herein. A respective client device may execute an operating system such as Microsoft Windows, Apple OS X, Linux, Apple iOS, and/or Google Android, as just a few examples. A user interface for a respective client device could be provided via a web browser such as Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and/or Apple Safari. As illustrated in FIG. **16**, a respective client device could take the form of a desktop computer, a laptop computer, a tablet computer, and/or a personal digital assistant (PDA), among numerous other possibilities. An example client device is described below with reference to FIG. **18**.

Server devices **104** and **1608** through **1612** may be any server devices capable of performing the server-device functions described herein. A respective server device may execute an operating system such as IBM z/OS, BSD (such as FreeBSD, NetBSD, and OpenBSD), Oracle Solaris (previously Sun Solaris), and/or any of the operating systems listed above with reference to the above-described client devices, among numerous other possibilities. A respective server device could function as a database server, a file server, a mail server, a web server, and/or an application server, as just a few examples.

In an embodiment, server device **104** functions as a web server and/or a proxy server, and one or more of server devices **1608** through **1612** function as a database server and/or a file server. Server device **104** retrieves one or more bookmarks and/or documents from one or more of server devices **1608** through **1612**. Server device **104** then provides a bookmark object and/or a bookmarked-document object to client device **102** based on the received bookmarks/documents.

The respective communication links may be any links capable of performing the communication-link functions described herein. The communication links may be a combination of hardware and/or software, perhaps operating on one or more communication-link layers such as one or more physical, network, transport, and/or application layers. In an embodiment, one or more of the communication links facilitate communication over a local-area network between server devices **104** and **1608** through **1612**. In an embodiment, one

or more of the communication links facilitate communication over a wide-area network (such as the Internet) between server device **104** and respective client devices **102** and **1602** through **1606**.

FIG. **17** is a block diagram of a client device, in accordance with various embodiments. As shown in FIG. **17**, client device **102** includes a processor **1702**, a data storage **1704**, a communication interface **1706**, and a user interface **1708**, each of which are interconnected via a system bus **1710**. Those having shill in the art will appreciate that client device **102** may include additional and/or different components.

Processor **1702** may take the form of one or more general-purpose processors and/or one or more special-purpose processors, and may be integrated in whole or in part with data storage **1704**, communication interface **1706**, and/or user interface **1708** (among other components). Data storage **1704** may store instructions **1712**, received repository data (such as received bookmark objects and bookmarked-document objects), and/or user-interface data, among numerous other possibilities. The data storage may take the form of a non-transitory computer-readable medium such as a hard drive, a solid-state drive, an EPROM, a USB storage device, a CD-ROM disk, a DVD disk, a relational database management system (RDBMS), any other non-volatile storage, or any combination of these, to name just a few examples. In an embodiment, instructions **1712** comprise machine-language instructions executable by processor **1702**. In an embodiment, instructions **1712** comprise script instructions as well as machine-language instructions for an interpreter; the machine-language interpreter instructions are executed by the processor, and the interpreter instructions in turn performs the actions specified in the script instructions. Those having skill in the art will recognize that instructions **1712** may take other forms as well.

Communication interface **1706** may be any component capable of performing the communication-interface functions described herein. As such, the communication interface could include or take the form of an Ethernet, Wi-Fi, Bluetooth, and/or universal serial bus (USB) interface, among many other possibilities.

User interface **1708** may be any component capable of carrying out the user-interface functions described herein. The user interface may be configured to both receive input from a user and output information to the user. User input might be achieved via a keyboard, a mouse, or another component communicatively linked to a general-purpose computer. As another possibility, input may be realized via a touchscreen display of a smartphone or tablet device. Output may be provided via a computer monitor or a loudspeaker (such as a computer speaker), again possibly communicatively linked to a general-purpose computer. Some components may provide for both input and output, such as the aforementioned touchscreen display. In an embodiment, the user interface is configured to receive input and provide output via a remote-desktop session: input provided by a user at a remote computer is received by the user interface (perhaps via communication **1706**), and output is sent to the remote computer for display to the user. Those having skill in the art will understand that user interface **1708** may take numerous other forms as well.

Bus **1710** may be any component(s) capable of performing the bus functions described herein. In an embodiment, the bus is any component(s) configured to transfer data between processor **1702**, data storage **1704**, communication interface **1706**, user interface **1708**, and/or any one or more other components that are part of client device **102**. In an embodiment, bus **1710** includes a traditional computer bus as is known in the art. In other embodiments, bus **1710** includes a serial RS-232 communication link, a universal serial bus (USB) communication link, and/or an Ethernet communication link, alone or in combination with a traditional computer bus, among numerous other possibilities. Those having skill in the art will recognize that bus **1710** may take various other forms as well.

FIG. **18** is a block diagram of a server device, in accordance with various embodiments. As shown in FIG. **18**, server device **104** includes a processor **1802**, a data storage **1804** having instructions **1810**, and a communication interface **1806**, each of which are interconnected via a system bus **1808**. Any of processor **1802**, data storage **1804**, communication interface **1806**, and system bus **1808** may (though needn't necessarily) take a form similar (or identical) to processor **1702**, data storage **1704**, communication interface **1706**, and system bus **1710**, respectively. Data storage **1804** may store documents, bookmarks, user-permission information, and/or deal-room information, among numerous other possibilities. Document, bookmarks, etc. may be received from another service device (such as a server device that includes a relational database management system), perhaps via communication interface **1806**. Those having shill in the art will appreciate that server device **104** may include additional and/or different components.

IV. EXAMPLE OPERATION

FIG. **19** is a sequence diagram of a method, in accordance with various embodiments. As shown in FIG. **19**, method **1900** begins at step **1902** with client device **102** sending an authentication request to server device **104**. The authentication request includes (or takes the form of) an authentication credential associated with a user of an electronic-document repository.

The authentication credential could take the form of (or include) input received via a user interface. In an embodiment, the authentication credential takes the form of a username and/or a password received via a computer keyboard. In an embodiment, the authentication credential includes a one-time password that was provided to the user via an SMS text message, an email message, a smartphone application, and/or a hardware token (e.g., an RSA SecurID token) received via a keyboard. In an embodiment, the authentication credential includes an eye scan or a face scan received via a camera, a voice pattern received via a microphone, and/or a fingerprint received via a fingerprint sensor.

The authentication credential could take the form of (or include) a software token such as an X.509 certificate stored in data storage (as just one example). The authentication credential could take the form of (or include) authentication information received via a hardware token (such as a smartcard).

In an embodiment, the authentication credential comprises data that is based on the authentication credential. For example, the authentication credential could be an encrypted value of a username and/or password. As another example, the authentication credential could be a hash value of a username and/or password as provided by a hash function (such as MD5 and SHA-1, as examples). As another possibility, the authentication credential could include the username and/or password as received via a user interface and without any encryption or hashing. Those having skill in the art will recognize that the authentication credential may take other forms as well.

At step **1904**, client device **102** receives from server device **104** one or more bookmark objects associated with respective

bookmarks to which the authentication credential authorizes access. Each respective bookmark is associated with a respective location in a respective document, and one or more of the bookmarks have been generated by one or more other users of the electronic-document repository.

In an embodiment, the respective bookmark objects comprise respective identifiers of the respective associated bookmarks and respective names of the respective associated bookmarks. A respective identifier could be a value of a primary key of a database table storing data associated with the respective bookmark. A respective identifier could include (or take the form of) the respective name of the respective bookmark.

In an embodiment, a respective location includes (or takes the form of) a page number, a section number, a paragraph number, a line number, a heading number, and/or a heading name, among other possibilities.

At step **1906**, client device **102** presents, via a user interface, one or more bookmark references corresponding to respective received bookmark objects. It should be understood that, while user interface **1708** is presented separately from client device **102** in FIG. **19**, the user interface could be part of the client device (as illustrated in FIG. **17**).

In an embodiment, at least one of the bookmark references comprises a respective title of the corresponding bookmark. In an embodiment, at least one of the bookmark comprises a respective identifier of the corresponding bookmark. In an embodiment, a respective bookmark reference takes the form of (or includes) a hyperlink. In an embodiment, a respective bookmark reference takes the form of a submit button of an HTML form.

At step **1908**, client device **102** receives, via the user interface, an indication of a selected bookmark reference. At step **1910**, client device **102** sends, to server **104**, a bookmarked-document request specifying the received bookmark object corresponding to the selected bookmark reference.

In an embodiment, the bookmarked-document request is based (at least in part) on an identifier of the respective bookmark associated with the selected respective bookmark reference. As another possibility the request could include metadata based on the identifier. The request could specify the respective location in the document. Other variations are possible as well.

At step **2014**, the client device receives, from server device **104**, a bookmarked-document object corresponding to the specified bookmark object. The bookmarked-document object includes a portion of the associated respective document at the associated respective location.

In an embodiment, the included portion of the associated respective document takes the form of (or includes) displayable image data of the respective document at the associated respective location. In an embodiment, the included portion includes a URL, URN, and/or URI at which client device **102** can retrieve displayable image data of the respective document at the associated respective location. In an embodiment, the included portion takes the form of HTML, JavaScript, and/or Adobe Flash data that, if interpreted by client device **102**, causes the client device to present the included portion of the associated respective document.

At step **1914**, client device **102** presents, via the user interface, the included portion of the associated respective document.

FIG. **20** is a flowchart of a method, in accordance with various embodiments. As shown in FIG. **20**, method **2000** begins at step **2002** with server device **104** receiving from client device **102** an authentication request comprising an authentication credential associated with a user of an electronic-document repository. The authentication request and/or the authentication credential could take a form similar (or identical) to the authentication request and authentication credential described above with reference to FIG. **19**, respectively.

At step **2004**, server device **104** sends to client device **104** one or more bookmark objects respectively associated with one or more bookmarks to which the authentication credential authorizes access. Each respective bookmark is associated with a respective location in a respective document, and one or more of the bookmarks have been generated by one or more other users of the electronic-document repository. The bookmark objects could take a form similar (or identical) to the bookmark objects described above with reference to FIG. **19**.

Server device **104** sending the bookmark objects associated with the one or more bookmarks to which the authentication credential authorizes access could include the server device determining the bookmarks to which the authentication credential authorizes access, as described above with reference to FIGS. **2** through **15**.

At step **2006**, server device **104** receives from client device **102** a bookmarked-document request specifying at least one of the one or more bookmark objects. At step **2008**, server device **104** sends to client device **104** a bookmarked-document object corresponding to the specified bookmark object. The bookmarked-document object includes a portion of the associated particular document at the associated particular location. The bookmarked-document request and/or the bookmarked-document object may take forms similar (or identical) to the bookmarked-document request and the bookmarked-document object described above with reference to FIG. **19**, respectively.

V. CONCLUSION

While some example embodiments have been described above, those of ordinary skill in the art will appreciate that numerous changes to the described embodiments could be made without departing from the scope and spirit of the claims.

The invention claimed is:

1. A method carried out by a client device, the method comprising:

sending, to a server device, an authentication request comprising an authentication credential associated with a user of an electronic-document repository;

receiving document data relating to a document in the electronic-document repository and displaying the document data in a graphical user interface, wherein the graphical user interface includes a bookmark creation button;

displaying a bookmark permissions interface comprising a list of user identifiers associated with the electronic-document repository;

receiving input comprising permissions information that includes one or more user identifiers from the list of user identifiers, and transmitting, to the server device, bookmark creation data comprising the permissions information and a respective location in the document;

receiving, from the server device, one or more user-specific bookmark objects having associated respective bookmarks, the user-specific bookmark objects having been identified in accordance with an authenticated user identifier associated with the authentication credential, each respective bookmark being associated with the authenticated user identifier and with a respective location in a

respective document, one or more of the respective bookmarks having been generated by one or more other users of the electronic-document repository;

presenting, via a user interface, one or more bookmark references corresponding to respective received user-specific bookmark objects;

receiving, via the user interface, an indication of a selected bookmark reference;

sending, to the server device, a bookmarked-document request specifying the received user-specific bookmark object corresponding to the selected bookmark reference;

receiving, from the server device, a bookmarked-document object corresponding to the specified user-specific bookmark object and including a portion of the associated respective document at the associated respective location; and

presenting, via the user interface, the included portion of the associated respective document.

2. The method of claim **1**, wherein the authentication credential comprises at least one of a username and a password.

3. The method of claim **1**, wherein the respective user-specific bookmark objects comprise respective identifiers of the respective associated bookmarks and respective names of the respective associated bookmarks.

4. The method of claim **1**, wherein the respective location comprises at least one of a page number, a section number, a paragraph number, a line number, a heading number, and a heading name.

5. The method of claim **1**, wherein at least one of the bookmark references comprises a respective title.

6. The method of claim **1**, wherein the bookmarked-document request comprises an identifier of the respective bookmark.

7. A client device, comprising:

a processor; and

data storage comprising instructions that, when executed by the processor, cause the client device to:

send, to a server device, an authentication request comprising an authentication credential associated with a user of an electronic-document repository;

receive document data relating to a document in the electronic-document repository and display the document data in a graphical user interface, wherein the graphical user interface includes a bookmark creation button;

display a bookmark permissions interface comprising a list of user identifiers associated with the electronic-document repository:

receive input comprising permissions information that includes one or more user identifiers from the list of user identifiers, and transmit to the server device bookmark creation data comprising the permissions information and a respective location in the document:

receive, from the server device, one or more user-specific bookmark objects having associated respective bookmarks, the user-specific bookmark objects having been identified in accordance with an authenticated user identifier associated with the authentication credential, each respective bookmark being associated with the authenticated user identifier and with a respective location in a respective document, one or more of the respective bookmarks having been generated by one or more other users of the electronic-document repository;

present, via a user interface, one or more bookmark references corresponding to respective received user-specific bookmark objects;

receive, via the user interface, an indication of a selected bookmark reference;

send, to the server device, a bookmarked-document request specifying the received user-specific bookmark object corresponding to the selected bookmark reference;

receive, from the server device, a bookmarked-document object corresponding to the specified user-specific bookmark object and including a portion of the associated respective document at the associated respective location; and

present, via the user interface, the included portion of the associated respective document.

8. The client device of claim **7**, wherein the authentication credential comprises at least one of a username and a password.

9. The client device of claim **7**, wherein the respective user-specific bookmark objects comprise respective identifiers of the respective associated bookmarks and respective titles of the respective associated bookmarks.

10. The client device of claim **7**, wherein the respective location comprises at least one of a page number and a section heading.

11. The client device of claim **7**, wherein at least one of the bookmark references comprises a respective title of the respective bookmark with which the respective user-specific bookmark object to which the bookmark reference corresponds is associated.

12. The client device of claim **7**, wherein the bookmarked-document request comprises an identifier of the respective bookmark with which the user-specific bookmark object to which the indicated bookmark reference corresponds is associated.

13. A method carried out by a server device, the method comprising:

receiving, from a client device, an authentication request comprising an authentication credential associated with a user of an electronic-document repository;

sending, to the client device, document data relating to a document in the electronic-document repository;

receiving, from a client device, bookmark creation data comprising user permissions information and a respective location in the document;

creating and storing a bookmark object based on the bookmark creation data and including the user permissions information;

sending, to the client device, one or more user-specific bookmark objects respectively associated with one or more bookmarks, the user-specific bookmark objects identified in accordance with an authenticated user identifier associated with the authentication credential, each bookmark having user permission information that includes the authenticated user identifier and also being associated with a particular location in a particular document, one or more of the bookmarks having been generated by one or more other users of the electronic-document repository;

receiving, from the client device, a bookmarked-document request specifying at least one of the one or more user-specific bookmark objects; and

sending, to the client device, a bookmarked-document object corresponding to the specified user-specific book-

mark object and including a portion of the associated particular document at the associated particular location.

14. The method of claim **13**, wherein the authentication credential comprises at least one of a username and a password.

15. The method of claim **13**, wherein the respective user-specific bookmark objects comprise respective identifiers of the respective associated bookmarks and respective titles of the respective associated bookmarks.

16. The method of claim **13**, wherein the respective location comprises at least one of a page number and a section heading.

17. The method of claim **13**, wherein at least one of the bookmark references comprises a respective title of the respective bookmark with which the respective user-specific bookmark object to which the bookmark reference corresponds is associated.

18. The method of claim **13**, wherein the bookmarked-document request comprises an identifier of the respective bookmark with which the user-specific bookmark object to which the indicated bookmark reference corresponds is associated.

19. A server device, comprising:

a processor; and

data storage comprising instructions that, when executed by the processor, cause the server device to:

receive, from a client device, an authentication request comprising an authentication credential associated with a user of an electronic-document repository;

send, to the client device, document data relating to a document in the electronic-document repository;

receive, from a client device, bookmark creation data comprising user permissions information and a respective location in the document:

create and store a bookmark object based on the bookmark creation data and including the user permissions information:

send, to the client device, one or more user-specific bookmark objects respectively associated with one or more bookmarks, the user-specific bookmark objects identified in accordance with an authenticated user identifier associated with the authentication credential, each bookmark having user permission information that includes the authenticated user identifier and also being associated with a particular location in a particular document, one or more of the bookmarks having been generated by one or more other users of the electronic-document repository;

receive, from the client device, a bookmarked-document request specifying at least one of the one or more user-specific bookmark objects; and

send, to the client device, a bookmarked-document object corresponding to the specified user-specific bookmark object and including a portion of the associated particular document at the associated particular location.

20. The server device of claim **19**, wherein the authentication credential comprises at least one of a username and a password.

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